

## ABSTRACT

Fluidic methods and devices for conducting parallel chemical reactions are disclosed. The methods are based on the use of in situ photogenerated reagents such as photogenerated acids, photogenerated bases, or any other suitable chemical compounds that produce active reagents upon light radiation. The present invention describes devices and methods for performing a large number of parallel chemical reactions without the use of a large number of valves, pumps, and other complicated fluidic components. The present invention provides microfluidic devices that contain a plurality of microscopic vessels for carrying out discrete chemical reactions. Other applications may include the preparation of microarrays of DNA and RNA oligonucleotides, peptides, oligosaccharides, phospholipids and other biopolymers on a substrate surface for assessing gene sequence information, screening for biological and chemical activities, identifying intermolecular complex formations, and determining structural features of molecular complexes.